

IN THE CLAIMS:

Claims 1-13. (Cancelled)

14. (Currently amended) A coil forming and insertion apparatus comprising:

a winding jig for forming a multipole coil of joined plural monopole coils; ~~said winding jig comprising plural coil winding frames, each of said coil winding frames defining a winding axis and receiving loops of wire wound thereon to form one of said plural monopole coils;~~

an inserter jig opposed to said winding jig, for inserting and arranging the multipole coil in slots ~~into a slot~~ extending radially outward from a central opening in a stator core coil, said inserter jig comprising plural coil receiving elements for respectively receiving the monopole coils from said coil winding frames, each of said coil receiving elements being aligned with a coil winding frame; and

transfer means for transferring the multipole ~~each monopole~~ coil from said winding jig to said inserter jig; and

wherein said winding jig comprises:

plural coil winding frames, each of said coil winding frames defining a winding axis and receiving loops of wire wound thereon to form one of said plural monopole coils

a turning arm rotatable around a central turning axis and an index holder rotatably supported by the turning arm for rotation relative to the turning arm around a central axis of rotation offset from and parallel to said central turning axis; and

wherein said plural coil winding frames are arranged depending from said

index holder in a circular array and approximately equidistant from said central axis of rotation;

wherein said winding axes of said respective coil winding frames are approximately parallel to each other and to said central turning axis; and

wherein each coil winding frame is reciprocally mounted for movement along said central turning axis relative to said index holder, between a retracted position and an advanced position wherein the winding frame is projected toward said inserter jig, axially beyond the remaining coil winding frames.

15. (Currently amended) The coil forming and insertion apparatus according to claim 14, wherein each coil winding frame has a tip face with a fitting slot extending therefrom in parallel with the winding axis, for receiving tip portions of the coil receiving elements, said coil receiving elements, when fitted within said fitting slots, forming transfer surfaces for moving said multipole coil from said winding jig onto said inserter jig.

16. (Currently amended) The coil forming and insertion apparatus according to claim 14, wherein ~~said winding jig~~ each of said coil winding frames has a piston mounted centrally of said coil winding frames ~~mounted~~ for reciprocating movement between a retracted position and an advanced position, whereby movement of said ~~piston~~ pistons toward the advanced position serves to transfer said multipole coil to said inserter jig.

17. (Currently amended) The coil forming and insertion apparatus according to claim

14, wherein each coil winding frame includes:

an inside portion and an outside portion radially outward of said inside portion relative to the winding axis; and

moving means for moving said outside portion relative to said inside portion to change the distance between the outside portion and the inside portion between a winding position for winding the electric wire thereon and a release position for removal of the monopole coil after the winding has been completed.

18. (Previously presented) The coil forming and insertion apparatus according to claim 17, wherein said outside winding frame portion is stepwise increased in diameter toward said inserter jig.

19. (Canceled)

20. (Currently amended) A coil forming and insertion apparatus comprising:

a winding jig, rotatable around a central axis, for forming a multipole coil of joined plural monopole coils, said winding jig comprising:

plural coil winding frames, each of said coil winding frames defining a winding axis and receiving loops of wire wound thereon to form one of said plural monopole coils, wherein said winding axes are approximately parallel to each other and equidistant from said central axis; and

a turning arm rotatable around a central turning axis and an index holder rotatably supported by the turning arm for rotation relative to the turning arm

around a central axis of rotation offset from and parallel to said central turning axis; and

an inserter jig opposed to said winding jig and comprising:

a plural slidable core, cores, respectively aligned with the central each winding axis, for inserting and arranging the multipole coil into a slot extending radially outward from a central opening in a stator; and

coil receiving elements arranged around an outer circumference of each slidable core for connecting with respective coil winding frames to form a transfer surface for transfer of the monopole coils from said coil winding frames onto said coil receiving elements, said slidable cores being extendable to transfer a monopole coil from a coil receiving element into the slot in the stator; and wherein said plural coil winding frames are arranged depending from said index holder in a circular array and approximately equidistant from said central axis of rotation;

wherein said winding axes of said respective coil winding frames are approximately parallel to each other and to said central turning axis; and

wherein each coil winding frame is reciprocally mounted for movement along said central turning axis relative to said index holder, between a retracted position and an advanced position wherein the winding frame is projected toward said inserter jig, axially beyond the remaining coil winding frames.

21. (Previously presented) The coil forming and insertion apparatus according to claim

20, wherein each coil winding frame has a tip face with a fitting slot extending therefrom in parallel with the winding axis, for receiving tip portions of the coil receiving elements, said coil receiving elements, when fitted within said fitting slots, forming transfer surfaces for moving said multipole coil from said winding jig onto said inserter jig.

22. (Currently amended) The coil forming and insertion apparatus according to claim 20, wherein said winding jig ~~each of said coil wind frames~~ has a piston centrally mounted for reciprocating movement along the central axis, between a retracted position and an advanced position, whereby movement of said piston ~~pistons~~ toward the advanced position serves to transfer said multipole coil to said inserter jig.

23. (Currently amended) The coil forming and insertion apparatus according to claim 20, wherein each coil winding frame includes:

an inside portion and an outside portion radially outward of said inside portion relative to the winding axis; and

moving means for moving said outside portion relative to said inside portion to change the distance between the outside portion and the inside portion between a winding position for winding the electric wire thereon and a release position for removal of the monopole coil after the winding has been completed.

24. (Previously presented) The coil forming and insertion apparatus according to claim 23, wherein said outside winding frame portion is stepwise increased in diameter toward said inserter jig.

25. (Canceled)

26. (Currently amended) A coil forming and insertion method utilizing a winding jig having plural winding frames for forming a multipole coil and an inserter jig for inserting and arranging the multipole coil in slots ~~a slot~~ extending radially outward from a central opening in a stator core, said method comprising:

winding an electric wire around each of the plural coil winding frames to form plural monopole coils connected as a mutipole coil; and

~~simultaneously~~ transferring the plural monopole coils from said winding frames onto coil receiving elements of said inserter jig; and

wherein each monopole coil is released from each coil winding frame by reducing the outside diameter of each coil winding frame in said transferring;

wherein, in the winding step, the outside diameter of each monopole coil is increased in a direction toward the inserter jig by winding the electric wire around a winding frame having its outside diameter increased stepwise in said direction; and

wherein, in the transferring step, each monopole coil is released from each coil winding frame by reducing the outside diameter of each coil winding frame in said direction.

27. (Previously presented) The coil forming and insertion method according to claim 26, wherein each monopole coil is delivered from a coil winding frame to a coil receiving element along a continuous surface formed by insertion of a tip portion of a coil

receiving element into a slot extending in parallel with the winding axis from an end face of a coil winding frame.

28. (Currently amended) The coil forming and insertion method according to claim 26, wherein the winding jig ~~each coil winding frame~~ comprises a piston ~~central slidable core~~ and wherein said transferring is by advancing the piston ~~slidable core~~ toward the inserter jig, whereby the multipole ~~each monopole~~ coil is delivered to a predetermined position on the inserter jig.

29. (Canceled)

30. (Canceled)

31. (Currently amended) A coil forming and insertion method comprising:

winding an electric wire into loops around each of plural coil winding frames of a winding jig to form a monopole coil on each of the winding frames, with the monopole coils joined together in a circular array as a multipole coil, wherein the coil winding frames are approximately parallel to each other;

inserting plural coil receiving elements, surrounding a core mounted on an ~~the~~ inserter jig for axial sliding movement relative to the receiving elements, into slots in ~~respective a central opening in each monopole coil mounted on a coil winding frames~~ frame and thereby connecting with the coil winding frames ~~frame~~ to form a transfer surfaces ~~surface~~;

transferring the monopole coils along the transfer surfaces, from the winding jig onto to the inserter jig; and

advancing the core ~~cores~~ of the inserter jig to insert the multipole coil into slots a slot in a stator core; and

wherein each monopole coil is released from each coil winding frame by reducing the outside diameter of each coil winding frame in said transferring;

wherein, in the winding step, the outside diameter of each monopole coil is increased in a direction toward the inserter jig by winding the electric wire around a winding frame having its outside diameter increased stepwise in said direction; and

wherein, in the transferring step, each monopole coil is released from each coil winding frame by reducing the outside diameter of each coil winding frame in said direction.

32. (Previously presented) The coil forming and insertion method according to claim 31, wherein each monopole coil is delivered from a coil winding frame to a coil receiving element along a continuous surface formed by insertion of a tip portion of a coil receiving element into a slot extending in parallel with the winding axis from an end face of a coil winding frame.

33. (Currently amended) The coil forming and insertion method according to claim 31, wherein the winding jig ~~each coil winding frame~~ comprises a piston ~~central slidable core~~ and wherein said transferring is by advancing the piston ~~slidable core~~ toward the inserter jig, whereby the multipole ~~each monopole~~ coil is delivered to a predetermined



position on the inserter jig.

34. (Canceled)

35. (Canceled)

36. (New) The coil forming and insertion method according to claim 26, wherein the inserter jig has plural coil receiving elements surrounding a core mounted for axial sliding movement relative to the coil receiving elements, wherein the central opening of the stator core is defined by an inner circumferential surface formed of teeth between the radially extending slots and wherein the method further comprises:

inserting the plural coil receiving elements into the central opening of the stator core facing the inner circumferential surface; and

advancing the core toward the stator core to insert the multipole coil into the slots of the stator core.

37. (New) The coil forming and insertion method according to claim 36, wherein the inserter jig further has guides between adjacent coil receiving elements and wherein the method further comprises aligning the guides facing the teeth prior to the advancing of the core relative to the stator core.

38. (New) The coil forming and insertion method according to claim 31, wherein the inserter jig further has guides between adjacent coil receiving elements and wherein the

method further comprises aligning the guides facing the teeth prior to the advancing of the core relative to the stator core.